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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of:	)	
	)	
John P. DONOGHUE et al.	)	Group Art Unit: 3762
	)	
Application No. 10/798,919	)	Examiner: Kahelin, Michael W.
	)	
Filed: March 12, 2004	)	
	)	
For: NEUROLOGICAL EVENT MONITORING AND THERAPY SYSTEMS AND RELATED METHODS	)	Confirmation No. 7030

Mail Stop Appeal Brief
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

APPEAL BRIEF UNDER 37 C.F.R. § 41.37

This is an appeal to the Board of Patent Appeals and Interferences ("the Board") from the Office Action dated March 28, 2006 ("Office Action"), rejecting claims 1-15, 20-22, 26-39, 48-50, 54, 58-61, 63-77, 82-84, 88-99, 105-111, 115, and 119-126, in the above-referenced patent application. Appellant submits this Appeal Brief pursuant to 37 C.F.R. § 41.37. The required appeal brief fee of $500.00 was previously paid on June 28, 2006 and should be applied to this Appeal Brief in accordance with M.P.E.P. § 1204.01.

This Appeal Brief is being filed concurrently with a petition for an extension of time for three (3) months, and the appropriate fee. A Notice of Appeal and Pre-Appeal

Brief Request for Review were filed on June 28, 2006. A Notice of Panel Decision from Pre-Appeal Brief Review was mailed on October 12, 2006. The time period for filing the Appeal Brief therefore was reset to November 12, 2006, and this Appeal Brief is being timely filed under 37 C.F.R. § 41.31.

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I. Real Party in Interest

The real party in interest is Cyberkinetics, Inc., the assignee of the entire right, title, and interest in the application, as indicated by assignment duly recorded in the U.S. Patent and Trademark Office ("Office") at Real 015624, Frame 0531 on July 27, 2004.

II. Related Appeals and Interferences

Appellants, Appellants' legal representatives, and assignee are aware of no other appeals, interferences, or judicial proceedings that may be related to, directly affect, be directly affected by, or have a bearing on the Board's decision in this appeal.

III. Status of Claims

Claims 1-54, 58-61, 63-115, and 119-151 are pending in this application, with claims 1, 64, 127, 138, 146, and 150 being independent. Of those pending claims, claims 16-19, 23-25, 40-47, 51-53, 78-81, 85-87, 100-104, 112-114, and 127-151 have been withdrawn from consideration.

Claims 1-15, 20-22, 26-39, 48-50, 54, 58-61, 63-77, 82-84, 88-99, 105-111, 115, and 119-126 have been rejected at least twice by the Office, and the rejections applied to those claims are at issue in this appeal. Those rejected claims are set forth in an attached Appendix.

IV. Status of Amendments

No amendments under 37 C.F.R. § 1.116 have been filed subsequent or in response to the final Office Action.

V. Summary of Claimed Subject Matter

A. Independent Claim 1

The subject matter set forth in claim 1 relates to, for example, a system 100 for predicting occurrence of a neurological event in a patient's body. The system 100 included an implant 200 (see, e.g., Figs. 1, 2, and 3), a processing unit 300 (*see, e.g.*, Figs. 1, 4, and 5), and a storage device 380 (*see, e.g.*, Fig. 1). (*See, e.g.*, Appellants' as-filed specification at paragraph [073].)[1] Implant 200 is configured to be placed in the body and detect signals indicative of an activity that precedes a neurological event. (*See, e.g.*, id. at paragraphs [073] to [076].) Processing unit 300 is configured to process the detected signals so as to predict the neurological event. (*See, e.g.*, id. at paragraph [073] and [082].) Storage device 380 is configured to store a target signal indicative of the activity that precedes the neurological event, wherein the target signal includes one or more previously detected signals indicative of the activity that precedes the event. (*See, e.g.*, id. at paragraphs [073], [082], and [089].) Processing unit 300 is further configured to compare the detected signals with the target signal to predict the neurological event prior to the occurrence of the event. (*See, e.g.*, id. at paragraphs [073], [082], and [094].)

B. Independent Claim 64

The subject matter set forth in claim 64 relates to, for example, a method for treating a neurological event in a patient. The method includes placing an implant in the

[1] The references to the specification and drawings in this Brief are merely intended to facilitate explaining how the originally-filed application provides exemplary embodiments and exemplary disclosure relating to the claimed subject matter. Those references should not be construed as limiting the claims.

patient's body, and detecting signals indicative of an activity that precedes the neurological event. (*See, e.g.*, id. at paragraphs [073], [082], and [094], Fig. 8, Step 610.) The method also may include predicting the occurrence of the neurological event based on the detected signals. (*See, e.g.*, id. at paragraphs [073], [082], and [094], Fig. 8, Step 640a.) Predicting the occurrence of the neurological event may include providing a target signal that includes one or more previously detected signals indicative of the activity that precedes the neurological event. (*See, e.g.*, id. at paragraphs [089] to [095], Figs. 6 and 7, Step 570.) The method may also include comparing the detected signals with the target signal. (*See, e.g.*, id. at paragraphs [073], [082], and [094], Fig. 8, Step 620.)

VI. Grounds of Rejection to be Reviewed on Appeal

Claims 1-15, 20-21, 26-39, 48-50, 54, 58, 59-61, 63-77, 82, 83, 88-99, 105, 106, 108-111, 115, and 119-126 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent Publication No. 2003/0004428 to Pless et al. ("Pless")(which incorporates by reference U.S. Patent No. 6,016,449 to Fischell et al. ("Fischell").

Claims 1-15, 20-21, 26-39, 48-50, 54, 58, 59, 61, 63-77, 82, 83, 88-99, 105, 106, 108-111, 115, and 119-126 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Pless in view of U.S. Patent No. 4,974,602 to Abraham-Fuchs et al. ("Abraham-Fuchs").

Claim 107 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Pless or Pless in view of Abraham-Fuchs.

Claims 22 and 84 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Pless (or Pless in view of Abraham-Fuchs) in view of U.S. Patent Publication No. 2003/0074032 to Gliner ("Gliner").

VII. Argument

A. Claims 1 and 64 Require a Target Signal That Includes a Previously Detected Signal Indicative of Activity That Precedes a Neurological Event

Embodiments of Appellants' invention include systems and methods for predicting and treating neurological events, such as epileptic seizures. For example, a sensor may be implanted in the brain to detect its electrical signals. The detected signals may be recorded in a storage device. When a sufficient amount of data has been recorded, the data may be analyzed to identify neurological events (e.g., seizures). Electrical signals associated with different neurological events for a particular patient often exhibit many of the same characteristics, including activity leading up to the event. To prevent or mitigate the effects of the event, signals indicative of the electrical activity preceding the event may be stored as a target signal. The target signal may be compared with real-time neurological activity of the patient to predict the occurrence of a neurological event. When the activity correlates substantially with the target signal, processes to mitigate the effects of the neurological event may be performed prior to the event, potentially reducing or eliminating its debilitating effects. Because the target signal includes a previously detected signal indicative of activity that precedes the event, the system reduces the potential for error in predicting the event.

Independent claim 1 therefore recites a system for predicting the occurrence of a neurological event in a patient 's body. The system includes an implant, a processing unit, and a storage device. The implant detects signals indicative of an activity that precedes the neurological event. The storage device contains a target signal that,

importantly for purposes of this appeal, *includes one or more previously detected signals indicative of the activity that precedes the neurological event.* The processing unit compares the detected signals with that target signal and processes the detected signals to predict the neurological event prior to the occurrence.

Whereas claim 1 recites a system, independent claim 64 recites a method for treating a neurological event in a patient. The method includes the steps of placing an implant in the patient's body, detecting signals indicative of an activity that precedes the neurological event, and predicting occurrence of the neurological event based on the detected signals. The predicting step includes comparing the detected signals with a target signal. Like claim 1, *the target signal includes one or more previously detected signals indicative of the activity that precedes the neurological event.*

B. The Section 102(b) Rejection of Claims 1 and 64 Based on Pless Should be Reversed

In the final Office Action, the Examiner rejected Appellants' claims 1-15, 20-21, 26-39, 48-50, 54, 58, 59-61, 63-77, 82, 83, 88-99, 105, 106, 108-111, 115, and 119-126 under 35 U.S.C. § 102(b) as being anticipated by Pless. Claims 1 and 64 are the only independent claims within that group. "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." M.P.E.P. § 2131 (citing Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628, 631, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987)). Since Pless fails to disclose or suggest each element of claim 1 or 64, the rejection of these claims based on Pless is improper and should be reversed.

1. Pless/Fischell Discloses Comparing Signals With a Threshold Described Only as Preset to Minimize Missing Real Events

Pless discloses a system to detect neurological events The Pless system includes an implanted device 110 that can detect neural activity and provide electrical stimulation in response. Device 110 houses a control module 410 having, among other things, a central processing unit 428, a memory subsystem 426, and a detection subsystem 426. Memory subsystem 426 may be coupled to detection subsystem 422 and configured to receive and store EEG signals detected by the detection subsystem 422. (*See* Pless at Figs. 1 and 4 and paragraphs [0087]-[0090].)

Paragraph [0022] of Pless incorporates Fischell by reference. In rejecting claim 1, the Examiner does not rely on the Pless text for a teaching of the claimed "target signal including one or more previously detected signals indicative of the activity that precedes the neurological event." Instead, the Examiner relies on only the incorporated Fischell disclosure for an alleged teaching of an "event detection algorithm . . . compris[ing] storing a target signal indicative of activity preceding a neurological event." (March 28, 2006 Office Action at page 3.) The Examiner specifically cites to a "threshold" in Fischell as the claimed "target signal," and cites to Figs. 5A-5D as allegedly showing that the threshold is compared to detected signals and is indicative of an activity that precedes a neurological event. (Id.)

The Examiner's interpretation of the Fischell algorithm is not correct. Fischell instead describes an event detection algorithm that collects EEG signals emitted by the epileptic focus using a plurality of electrodes 15A-15N. (*See* Fischell, Fig. 1.) A

processor then subjects those signals to numerous signal conditioning steps to enhance event detection. One of those steps time synchronizes the signals. Because each electrode 15A-15N may be located a different distance from the epileptic focus, the processor synchronizes the EEG signals to account for the time it takes the signal to travel from the epileptic focus to each electrode. (*See* id. at column 15, line 45 to column 16, line 4). The three electrode traces of Figs. 5A-5C show the time delay average for a particular EEG signal, identified as 6A for a first electrode in Fig. 5A, 6B for a second electrode in Fig. 5B, and 6C for a third electrode in Fig. 5C. The signal may be summed with a delay algorithm to produce the time-synchronized signal of Fig. 5D. (*See* id. at column 16, line 43 to column 17, line 8.)

That time-synchronized signal is compared to "a fixed event detection threshold 369 as shown in FIG. 5D." (Id. at column 17, lines 9-12.) If the amplitude of the signal is greater than the preset event detection threshold level, an event signal is transmitted to a counter, which determines whether the number of event signals exceeds an allowable number. (*See* id., column 19, lines 4-13 and 37-43).

Fischell, however, includes very little explanation of the event detection threshold. The reference merely states that it "will typically be programmed to minimize the chance of missing a 'real' neurological event even though this could result in the occasional false positive identification of an event." (*See* id. at column 20, lines 19-28). Fischell includes no teaching of the threshold including a *previously detected signal* indicative of activity that precedes a neurological event.

2. Pless/Fischell Does Not *Expressly* Disclose a Target Signal that Includes a "Previously Detected Signal"

Fischell therefore does not expressly disclose that the threshold "include[es] one or more *previously detected signals* indicative of the activity that precedes the neurological event," as recited in Appellants' claims. Indeed, the Examiner has twice admitted as much. In the final Office Action, the Examiner states that "Pless discloses the essential features of the claimed invention *except for explicitly specifying that the target signals be previously detected.*" (*See* March 28, 2006 Office Action at page 7; emphasis added.) After Appellants' response to that Office Action, the Examiner once again admitted that "Pless and Fischell do not *explicitly* disclose that the target signal includes one or more previously detected signals." (May 18, 2006 Advisory Action at page 2; emphasis added.) There is no question that Pless and Fischell do not expressly disclose the claimed target signal.

3. Pless/Fischell Does Not *Inherently* Disclose a Target Signal that Includes a "Previously Detected Signal"

Recognizing that Pless/Fischell does not expressly disclose the claimed target signal, the Examiner asserts that the threshold inherently includes a previously detected signal. In the final rejection, the "Examiner is interpreting a threshold as a constant level signal that is *inherently* set by some previous signal." (March 28, 2006 Office Action at page 3; emphasis added.) The Examiner further asserts that:

> Fischell does *implicitly* specify that the target signal includes a previously detected signal at column 20, line 19. For the threshold to be adjusted to provide the desired number of false positives, the threshold must be based on a previously detected signal threshold.

(May 18, 2006 Advisory Action at page 2; emphasis added.)

The fact that a certain characteristic may be present in the prior art is not sufficient to establish the inherency of that characteristic. *In re Rijckaert*, 9 F.3d 1531, 1534, 28 U.S.P.Q.2d 1955, 1957 (Fed. Cir. 1993.) "To establish inherency, the extrinsic evidence 'must make clear that missing descriptive matter is *necessarily* present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill.'" *In re Robertson*, 169 F.3d 743, 745, 49 U.S.P.Q.2d 1949, 1950-51 (Fed Cir. 1999) (citations omitted) (emphasis added).

Contrary to the Examiner's assertion, however, Fischell does not teach that the threshold *necessarily* includes a previously detected signal. In fact, Fischell simply refers to the threshold as "a preset threshold level" that "will typically be programmed to minimize the chance of missing a 'real' neurological event." (*See* Fischell, column 19, lines 37-43 and column 20, lines 19-26.) This disclosure, together with Fischell's failure to disclose or suggest how this preset threshold value is established, indicates that the threshold in Fischell does not *necessarily* include a previously detected signal. Presetting a threshold to achieve false positives does not *necessarily* imply that the threshold is a "previously detected signal indicative of the activity that precedes the neurological event," as claimed.

Instead, for example, the threshold certainly could be selected as an arbitrarily low value to ensure a sufficient number of false positives. Or, as another example, the threshold may be selected based on data collected from seizure-free test subjects (human or other non-human primates, for example) to establish a comparative

benchmark indicative of "normal" neurological activity. Signals diverging from that norm could indicate a neurological event. In both of these examples, the threshold is not a "previously detected signal indicative of the activity that precedes the neurological event."

For these reasons, Fischell does not *inherently* disclose the claimed "target signal including one or more previously detected signals indicative of the activity that precedes the neurological event." Because Fischell admittedly also expressly lacks such disclosure, Pless and Fischell fail to disclose every element of independent claims 1 and 64. Accordingly, the 35 U.S.C. § 102(b) rejection with respect to claims 1 and 64 is improper and should be withdrawn.

C. The Section 103(a) Rejection of Claims 1 and 64 Based on Pless and Abraham-Fuchs Should be Reversed

Tacitly recognizing that Pless is missing a claim element, namely that the target signal includes a previously detected signal indicative of activity that precedes a neurological event, the Examiner follows the Pless anticipation rejection with an obviousness rejection combining Pless with Abraham-Fuchs.[2] In order to establish a prima facie case of obviousness under 35 U.S.C. § 103(a), however, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine the reference teachings in a manner

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2 Specifically, in the Final Office Action, the Examiner rejected claims 1-15, 20-21, 26-39, 48-50, 54, 58, 59, 61, 63-77, 82, 83, 88-99,105,106,108-111, 115, and 119-126 under 35 U.S.C. § 103(a) based on Pless in view of Abraham-Fuchs. Claims 1 and 64 are the only independent claims in that group.

resulting in the claimed invention. (*See* M.P.E.P. 2143.01.) Second, a reasonable expectation of success must exist. (*See* M.P.E.P. 2143.02.) Third, the prior art reference or references, taken alone or combined, must teach or suggest each and every element recited in the claims. (*See* M.P.E.P. 2143.03.) The Examiner's combination of Pless and Abraham-Fuchs fails in at least this third respect.

1. The Examiner Admits That Pless Does Not Teach the Claimed Target Signal

As discussed above, Pless does not disclose at least the claimed target signal that includes a previously detected signal indicative of activity that precedes a neurological event. In the Section 103(a) rejection, the Examiner indeed states that "Pless discloses the essential features of the claimed invention except for explicitly specifying that the target signals be previously detected." (March 28, 2006 Office Action at page 7.)

2. The Abraham-Fuchs "Template" Does Not Include a Previously Detected Signal Indicating Activity *Preceding* an Event

In an attempt to cure that deficiency, the Examiner suggests that it would have been obvious to combine the system of Abraham-Fuchs with the Pless system to arrive at Appellants' claimed invention. Specifically, the Examiner asserts:

> Abraham-Fuchs teaches providing a system for recognizing neurological events by comparing a detected signal to a previously detected template signal indicative of activity preceding a neurological event (abstract) to allow recognition of pathologies with high patient-to-patient variability (col. 1, line 41). Therefore, it would have been obvious to provide Pless' invention by comparing a detected signal to a previously detected template signal indicative of activity preceding a neurological event to allow recognition of pathologies with high patient-to-patient variability.

(March 28, 2006 Office Action at pages 7-8.) As will be described, however, the Abraham-Fuchs "template" does not include a previously detected signal indicative of activity preceding a neurological event.

Abraham-Fuchs discloses a system having electrodes to measure electrical signals in a patient's brain. The system can recognize specific signal patterns within the electrical signals to form a template, which is stored in a memory unit. The system compares an incoming signal with a stored template to recognize specific events.

The Abraham-Fuchs template, however, does *not* include a signal indicative of activity preceding a neurological event. The arrangement of Abraham-Fuchs only recognizes certain signal portions associated with particular neurological activity, the pathological significance of which is unclear. (*See* Abraham-Fuchs, column 6, lines 23-32.) The system defines signal templates as particular portions of a signal that include markedly different waveforms. (*See* id.) A template is a particular portion of the signal containing that marked difference in activity. Abraham-Fuchs does not disclose that the template is a signal that *precedes* the activity.

For example, Figure 2 of Abraham-Fuchs shows an electrocphalogram from a representative EEG sensor. Signal portions S2 and S3 differ markedly from other signal portions, and therefore the S2-S3 complex is chosen as a template, without the preceding signal S1. (*See* id.) Thus, the signal template disclosed in Abraham-Fuchs, which is simply portions of a signal that differ markedly from preceding and following

signals, does not constitute a target signal that includes one or more previously detected signals indicative of activity that *precedes* a neurological event.[3]

In response to these arguments, the Examiner states that "Abraham-Fuchs was relied upon merely for the teaching of target signals that are based on previous patient data or activity." (May 18, 2006 Advisory Action at page 3.) Even accepting, for argument's sake, that the reference includes such a teaching, "previous patient data or activity" does not constitute a signal indicative of the activity that precedes a neurological event, as recited in independent claims 1 and 64. Previous patient data is simply data collected at an earlier time. The Examiner's response concedes that the Abraham-Fuchs signal template does not include a previously detected signal *indicative of activity that precedes a neurological event.*

Since Pless also does not disclose such a target signal, the combination does not suggest every element of claim 1 or 64, and the Section 103(a) rejection should be withdrawn.

D. Each Dependent Claim is Patentable at Least by Virtue of its Dependency From Claim 1 or 64

Each of dependent claims 2-15, 20-21, 26-39, 48-50, 54, 58, 59-61, 63, 65-77, 82, 83, 88-99, 105, 106, 108-111, 115, and 119-126 depends, either directly or indirectly, from independent claim 1 or 64. As discussed above, independent claims 1 and 64 are patentable over Pless and the alleged combination of Pless and Abraham-

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3 In the final Office Action the Examiner asserts that the Abstract allegedly discloses that the template signal is indicative of activity preceding a neurological event. (*See* March 28, 2006 Office Action at page 7.) Appellants have not found any such teaching in the Abstract.

Fuchs. Thus, at least by virtue of their dependencies from allowable independent claims 1 and 64, these dependent claims are also patentable.

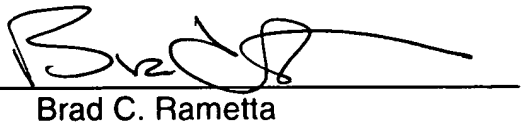
E. Conclusion

For the reasons given above, all of the pending, examined claims are patentable over the cited references. The Board is therefore respectfully requested to reverse the outstanding rejections under 35 U.S.C. § 102(b) and 35 U.S.C. § 103(a), so that those claims may be allowed.

To the extent any extension of time under 37 C.F.R. § 1.136 is required to obtain entry of this Appeal Brief, such extension is hereby respectfully requested. If there are any fees due which are not enclosed herewith, please charge such fees to our Deposit Account No. 06-0916.

Respectfully submitted,
FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, L.L.P.

Dated: February 12, 2007

By: 

Brad C. Rametta
Reg. No. 54,387
Finnegan, Henderson, Farabow,
Garrett & Dunner, L.L.P.
Customer No. 22,852

VIII. Claims Appendix

1. A system for predicting occurrence of a neurological event in a patient 's body, comprising:

an implant configured to be placed in the body and detect signals indicative of an activity that precedes the neurological event;

a processing unit configured to process the detected signals so as to predict the neurological event prior to the occurrence;

a storage device containing a target signal indicative of the activity that precedes the neurological event, the target signal including one or more previously detected signals indicative of the activity that precedes the neurological event; and

wherein the processing unit is configured to compare the detected signals with the target signal.

2. The system of claim 1, wherein the implant is configured to be placed in a patient's brain.

3. The system of claim 2, wherein the implant includes at least one multi-electrode array, the multi-electrode array including a plurality of electrodes.

4. The system of claim 3, wherein the plurality of electrodes are configured to penetrate into neural tissue of the brain to detect electrical signals generated from the neurons.

5. The system of claim 3, wherein the multi-electrode array includes at least one of a recording electrode, a stimulating electrode, and an electrode having recording and stimulating capabilities.

6. The system of claim 3, wherein the at least one multi-electrode array is configured to detect electrical signals indicative of a neural activity preceding the neurological event.

7. The system of claim 2, wherein the implant is configured to detect electrical signals generated from the neurons located proximate the implant.

8. The system of claim 7, wherein the processing unit is configured to convert the detected electrical signals into a recognizable pattern.

9. The system of claim 8, wherein the recognizable pattern includes a formula describing a behavior of the neurons in time and space.

10. The system of claim 7, wherein the implant is configured to isolate individual neuron signals from neighboring neuron signals.

11. The system of claim 7, wherein the detected electrical signals generated from the neurons include electrical spikes.

12. The system of claim 11, wherein the processing unit is configured to characterize a pattern of the electrical spikes that represent a neural activity preceding the neurological event, so as to predict the occurrence of the neurological event.

13. The system of claim 2, wherein the implant is configured to be placed proximate a neural focus in the brain that initiates the neurological event.

14. The system of claim 2, wherein the implant is configured to detect local field potentials of the brain.

15. The system of claim 2, wherein the implant is configured to detect electrocorticogram (ECoG) signals.

16. (Withdrawn) The system of claim 2, wherein the implant is configured to detect electroencephalogram (EEG) signals.

17. (Withdrawn) The system of claim 2, wherein the implant is configured to detect DC potentials.

18. (Withdrawn) The system of claim 2, wherein the implant is configured to detect light generated from the neurons located proximate the implant.

19. (Withdrawn) The system of claim 2, wherein the implant is configured to detect acoustic waves generated from the neurons located proximate the implant.

20. The system of claim 2, wherein the implant comprises a subdural grid having a plurality of electrode contacts and configured to be placed on a surface of the brain.

21. The system of claim 20, wherein the implant further comprises at least one multi-electrode array.

22. The system of claim 2, wherein the implant includes a movement sensor configured to detect movement of the brain.

23. (Withdrawn) The system of claim 2, wherein the implant includes a pressure monitoring device for monitoring pressure in the brain.

24. (Withdrawn) The system of claim 2, wherein the implant includes a temperature monitoring device for monitoring temperature in the brain.

25. (Withdrawn) The system of claim 2, wherein the implant includes a magnetic resonance monitoring device for monitoring magnetic resonance intensity in the brain.

26. The system of claim 1, wherein the processing unit is configured to characterize the signals that represent the activity preceding the neurological event.

27. The system of claim 1, further comprising a storage device for storing the signals that represent the activity preceding the neurological event.

28. The system of claim 27, wherein the processing unit is configured to compare the detected signals with the signals stored in the storage device.

29. The system of claim 1, wherein the processing unit includes a recording device for recording the detected signals.

30. The system of claim 1, wherein the implant is configured to detect biological or physiological signals generated within the patient's body.

31. The system of claim 1, further comprising a sensor for detecting other signals generated from the body, the sensor is configured to communicate with the processing unit.

32. The system of claim 31, wherein the processing unit is configured to compare the signals detected by the implant and the other signals detected by the sensor.

33. The system of claim 1, wherein the processing unit is configured to differentiate the signals indicative of the activity that precedes the neurological event from signals resulting from normal activities.

34. The system of claim 1, wherein the processing unit is configured to output information relating to a patient's condition with respect to the neurological event.

35. The system of claim 34, wherein the processing unit includes an indicator for conveying the information to the patient.

36. The system of claim 34, further comprising an external device being in communication with the processing unit, the external device configured to display the information relating to the patient's condition with respect to the neurological event.

37. The system of claim 36, wherein the processing unit is configured to receive an input signal from the external device.

38. The system of claim 36, wherein the external device includes at least one of a visual indicator, a tactile transducer, an auditory indicator, and a light emitting device.

39. The system of claim 34, wherein the information includes a warning signal that the neurological event is expected to occur.

40. (Withdrawn) The system of claim 34, wherein the information includes a time remaining until the occurrence of the neurological event.

41. (Withdrawn) The system of claim 34, wherein the information includes an occurrence probability of the neurological event.

42. (Withdrawn) The system of claim 34, wherein the information includes severity of the neurological event.

43. (Withdrawn) The system of claim 34, wherein the information includes a patient's current condition in comparison with a normal target condition.

44. (Withdrawn) The system of claim 34, wherein the information includes instructions for preventing the neurological event from occurring.

45. (Withdrawn) The system of claim 34, wherein the information includes a stimulating signal provided to the patient to cause a movement of a portion of the patient's body.

46. (Withdrawn) The system of claim 45, wherein the stimulating signal is sent to the implant.

47. (Withdrawn) The system of claim 45, wherein the portion of the patient's body is a finger.

48. The system of claim 1, wherein, upon predicting the occurrence of the neurological event, the processing unit is configured to generate a control signal to suppress, dampen, or delay the neurological event.

49. The system of claim 48, wherein the control signal includes an electrical current sent to a patient's brain to stimulate at least a portion of the brain.

50. The system of claim 48, wherein the control signal is configured to stimulate a central nervous system and/or a peripheral nervous system.

51. (Withdrawn) The system of claim 48, further comprising a drug delivery system, wherein the processing unit sends a signal to the drug delivery system to deliver a therapeutic agent or drug to at least a portion of the patient's body.

52. (Withdrawn) The system of claim 1, wherein, upon predicting the occurrence of the neurological event, the processing unit is configured to hyperpolarize at least a portion of the brain.

53. (Withdrawn) The system of claim 44, wherein the processing unit sends a DC bias current to a patient's brain to hyperpolarize the at least a portion of the brain.

54. The system of claim 1, wherein:
the implant includes one or more electrodes; and
upon predicting the occurrence of the neurological event, the processing unit is configured to reduce the impedance between the one or more electrodes.

55-57. (Cancelled)

58. The system of claim 1, wherein the processing unit is configured to modify the target signal.

59. The system of claim 1, wherein the neurological event is an epileptic symptom.

60. The system of claim 1, wherein the implant is placed proximate an epileptic focus of a brain.

61. The system of claim 1, wherein the neurological event is an undesired activity.

62. (Cancelled)

63. The system of claim 61, wherein the implant is configured to be placed in a brain and measure readiness potential of the brain, indicative of occurrence of the undesired activity.

64. A method for treating a neurological event in a patient, comprising:

placing an implant in the patient's body;

detecting signals indicative of an activity that precedes the neurological event;

predicting occurrence of the neurological event based on the detected signals, wherein predicting includes:

providing a target signal indicative of the activity that precedes the neurological event, the target signal including one or more previously detected signals indicative of the activity that precedes the neurological event; and

comparing the detected signals with the target signal.

65. The method of claim 64, further comprising placing the implant in the patient's brain.

66. The method of claim 65, wherein the implant includes at least one multi-electrode array, the multi-electrode array including a plurality of electrodes.

67. The method of claim 66, wherein the plurality of electrodes are configured to penetrate into neural tissue of the brain to detect electrical signals generated from the neurons.

68. The method of claim 66, wherein the multi-electrode array includes at least one of a recording electrode, a stimulating electrode, and an electrode having recording and stimulating capabilities.

69. The method of claim 66, further comprising detecting electrical signals with the multi-electrode array, the electrical signals being indicative of a neural activity preceding the neurological event.

70. The method of claim 66, further comprising detecting electrical signals generated from the neurons located proximate the implant.

71. The method of claim 70, further comprising processing the detected electrical signals to convert the signals into a recognizable pattern.

72. The method of claim 71, wherein the recognizable pattern includes a formula describing a behavior of the neurons in time and space.

73. The method of claim 66, further comprising processing the detected electrical signals to isolate individual neuron signals from neighboring neuron signals.

74. The method of claim 66, wherein the detected electrical signals generated from the neurons include electrical spikes.

75. The method of claim 65, wherein the implant is placed proximate a neural focus in the brain that initiates the neurological event.

76. The method of claim 65, wherein the implant is configured detect local field potentials of the brain.

77. The method of claim 65, wherein the implant is configured to detect electrocorticogram (ECoG) signals.

78. (Withdrawn) The method of claim 65, wherein the implant is configured to detect electroencephalogram (EEG) signals.

79. (Withdrawn) The method of claim 65, wherein the implant is configured to detect DC potentials.

80. (Withdrawn) The method of claim 65, wherein the implant is configured to detect light generated from the neurons located proximate the implant.

81. (Withdrawn) The method of claim 65, wherein the implant is configured to detect acoustic waves generated from the neurons located proximate the implant.

82. The method of claim 65, wherein the implant comprises a subdural grid having a plurality of electrode contacts, the subdural grid being placed on a surface of the brain.

83. The method of claim 82, wherein the implant further comprises at least one multi-electrode array.

84. The method of claim 65, wherein the implant includes a movement sensor configured to detect movement of the brain.

85. (Withdrawn) The method of claim 65, wherein the implant includes a pressure monitoring device for monitoring pressure in the brain.

86. (Withdrawn) The method of claim 65, wherein the implant includes a temperature monitoring device for monitoring temperature in the brain.

87. (Withdrawn) The method of claim 65, wherein the implant includes a magnetic resonance monitoring device for monitoring magnetic resonance intensity in the brain.

88. The method of claim 64, further comprising processing the detected signals to characterize the signals that represent the activity preceding the neurological event.

89. The method of claim 64, further comprising storing the signals that represent the activity preceding the neurological event into a storage device.

90. The method of claim 89, further comprising comparing the detected signals with the signals stored in the storage device.

91. The method of claim 64, further comprising comparing the detected signals with other signals detected by a sensor in the patient's body.

92. The method of claim 64, further comprising recording the detected signals.

93. The method of claim 64, wherein the detected signals include biological or physiological signals generated within the patient's body.

94. The method of claim 64, further comprising differentiating the signals indicative of the activity that precedes the neurological event from signals resulting from normal activities.

95. The method of claim 64, further comprising outputting information relating to the patient's condition with respect to the neurological event.

96. The method of claim 95, wherein outputting information includes conveying the information to the patient.

97. The method of claim 95, wherein the information includes a warning signal that the neurological event is expected to occur.

98. The method of claim 95, wherein outputting information includes communicating with an external device to convey the information.

99. The method of claim 98, wherein the external device includes at least one of a visual indicator, a tactile transducer, and an auditory indicator.

100. (Withdrawn) The method of claim 95, wherein the information includes a time remaining until the occurrence of the neurological event.

101. (Withdrawn) The method of claim 95, wherein the information includes an occurrence probability of the neurological event.

102. (Withdrawn) The method of claim 95, wherein the information includes severity of the neurological event.

103. (Withdrawn) The method of claim 95, wherein the information includes a patient's current condition in comparison with a normal target condition.

104. (Withdrawn) The method of claim 95, wherein the information includes instructions for preventing the neurological event from occurring.

105. The method of claim 95, wherein outputting the information includes causing a movement of a portion of the patient's body.

106. The method of claim 105, wherein causing the movement includes sending a stimulating signal to the implant.

107. The method of claim 105, wherein the portion of the patient's body includes a finger.

108. The method of claim 64, further comprising, upon predicting the occurrence of the neurological event, generating a control signal for treating the patient.

109. The method of claim 108, wherein the control signal controls, suppresses, dampens, and/or delays the neurological event.

110. The method of claim 108, wherein generating a control signal includes generating a stimulating electrical current and sending the current to a portion of the patient's body.

111. The method of claim 110, wherein the portion of the patient's body includes the patient's brain.

112. (Withdrawn) The method of claim 108, wherein generating a control signal includes generating a signal to deliver a drug or a therapeutic agent to at least a portion of the patient's body.

113. (Withdrawn) The method of claim 64, further comprising, upon predicting the occurrence of the neurological event, hyperpolarizing at least a portion of the patient's brain.

114. (Withdrawn) The method of claim 113, wherein hyperpolarizing includes sending a DC bias current to the patient's brain to hyperpolarize the at least a portion of the brain.

115. The method of claim 64, wherein:

the implant includes one or more electrodes; and

upon predicting the occurrence of the neurological event, the processing unit is configured to reduce the impedance between the one or more electrodes.

116-118. (Cancelled)

119. The method of claim 64, further comprising modifying the target signal.

120. The method of claim 119, wherein modifying the target signal includes performing an adaptive processing of the target signal.

121. The method of claim 119, wherein the adaptive processing includes:

determining whether the neurological event occurred, regardless of whether the occurrence was predicted;

determining whether the occurrence or nonoccurrence of the neurological event was mistakenly predicted; and

modifying the target signal based on whether the occurrence or nonoccurrence of the neurological event was mistakenly predicted.

122. The method of claim 64, wherein the neurological event is an epileptic symptom.

123. The method of claim 122, further comprising placing the implant proximate an epileptic focus of a brain.

124. The method of claim 64, further comprising preprocessing the detected signal.

125. The method of claim 124, wherein preprocessing includes measuring background signals and calibrating the detected signal based on the measured background signals.

126. The method of claim 124, wherein preprocessing includes at least one of: noise filtering, impedance matching, rectifying, integrating, differentiating, discretizing, and amplifying the detected signals.

127. (Withdrawn) A system for detecting a neurological event in a patient 's body, comprising:

at least one electrode placed within a patient's brain and configured to detect electrical signals generated from the brain; and

a control module in communication with the at least one electrode and comprising:

an event detection device configured to identify occurrence of the neurological event based on the detected electrical signals; and

a data recording device including a counter synchronized with an external clock;

wherein, upon identifying occurrence of the neurological event by the event detection device, the recording device is configured to record the detected electrical signals and a value of the counter.

128. (Withdrawn) The system of claim 127, wherein the value of the counter is configured to increase by one in every predetermined time interval.

129. (Withdrawn) The system of claim 127, further comprising an external device configured to communicate with the control module, wherein the external device is configured to receive the value of the counter and the detected electrical signals from the remote module.

130. (Withdrawn) The system of claim 129, wherein the external device is configured to convert the value of the counter to a real-time value.

131. (Withdrawn) The system of claim 129, wherein the external device is configured to transmit a start signal to the control module to upload the value of the counter and the detected electrical signals to the external device or other processing device.

132. (Withdrawn) The system of claim 129, wherein the external device is configured to receive a start signal to the remote module or other processing device to download the value of the counter and the detected electrical signals from the control module.

133. (Withdrawn) The system of claim 127, wherein the at least one electrode includes at least one multi-electrode array, the multi-electrode array including a plurality of electrodes.

134. (Withdrawn) The system of claim 133, wherein the plurality of electrodes are configured to penetrate into neural tissue of the brain to detect electrical signals generated from the neurons.

135. (Withdrawn) The system of claim 127, wherein the at least one electrode is configured to detect local field potentials of the brain.

136. (Withdrawn) The system of claim 127, wherein the at least one electrode is configured to detect electrocorticogram (ECoG) signals.

137. (Withdrawn) The system of claim 127, wherein the at least one electrode is configured to detect electroencephalogram (EEG) signals.

138. (Withdrawn) A device for placing an implant in a patient's body, comprising:

an elongated member having a distal sleeve, the distal sleeve having a first portion and a second portion and configured to receive the implant between the first portion and the second portion, the first portion and the second portion being configured to move relative to each other,

wherein at least the first portion includes an expandable member so as to push the implant towards an implant site in the patient's body.

139. (Withdrawn) The device of claim 138, wherein the elongated member is configured to be bent or turned.

140. (Withdrawn) The device of claim 138, wherein the elongated member is sufficiently flexible to traverse through tortuous paths within the patient's body.

141. (Withdrawn) The device of claim 138, further comprising the implant, wherein the implant includes a plurality of electrodes for placement in a brain of the patient, and wherein at least one of the first portion and the second portion is configured to cover the plurality of electrodes.

142. (Withdrawn) The device of claim 138, wherein the first portion is inflatable.

143. (Withdrawn) The device of claim 138, further comprises a substantially rigid backing member, wherein the first portion is configured to push against the backing member to expand towards an implant site.

144. (Withdrawn) The device of claim 138, further comprising a grasping member to grasp the implant.

145. (Withdrawn) The device of claim 138, wherein at least a portion of the device is made of a bioabsorbable material.

146. (Withdrawn) A system for detecting occurrence of an undesired activity in a person, comprising:

an implant configured to be placed in the body and detect signals indicating that the undesired activity is occurring or is about to occur; and

a processing unit configured to process the detected signals and generate a control signal to prevent the undesired activity and/or warn the person or a third person.

147. (Withdrawn) The system of claim 146, wherein the control signal is at least one of an electrical signal and a chemical signal.

148. (Withdrawn) The system of claim 146, wherein the control signal is inputted to the brain.

149. (Withdrawn) The system of claim 146, wherein the control signal is inputted to at least a portion of the central nervous system and/or peripheral nervous system to prevent the undesired activity.

150. (Withdrawn) A system for detecting and treating a neurological event in a patient's body, comprising:

an implant configured to be placed in the body and detect signals generated from the body;

an external device; and

a processing unit configured to process the detected signals and generate a control signal that controls the operation of the external device.

151. (Withdrawn) The system of claim 151, wherein the external device is a movement device, the movement of the device being controlled by the processing unit.

IX. Evidence Appendix

None

X. Related Proceedings Appendix

None